UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00147

April 15, 2003

Mr. Daniel T. Harkenrider
Area Manager
U.S. Forest Service
Columbia River Gorge National Scenic Area
902 Wasco Avenue
Hood River, OR 97031

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Effects of the Maintenance Dredging in Multnomah Creek, Multnomah County, Oregon

Dear Mr. Harkenrider:

Enclosed is a biological opinion (Opinion) pursuant to section 7 of the Endangered Species Act (ESA) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries), on the effects of proposed maintenance dredging in Multnomah Creek, Multnomah County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Lower Columbia River steelhead (*Oncorhynchus mykiss*), Lower Columbia River chinook salmon (*O. tshawytscha*), and Columbia River chum salmon (*O. keta*). As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document also serves as consultation on essential fish habitat for chinook and coho salmon pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600.

If you have any questions regarding this consultation, please contact Art Martin of my staff in the Oregon Habitat Branch at 503.231.6848.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Diana Hwang, USFWS
Tom Murtagh, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Maintenance Dredging in Multnomah Creek,
Multnomah County, Oregon

Agency:	U.S. Forest Service
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	April 15, 2003
Issued by:	for Michael R Crouse _____ D. Robert Lohn Regional Administrator
Refer to:	**2003/00147**

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1. INTRODUCTION

1.1 Background

On February 21, 2003, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a request, including a biological assessment (BA), from the U.S. Forest Service Columbia River Gorge National Scenic Area (CRGNSA) for Endangered Species Act (ESA) section 7 formal consultation and Magnuson-Stevens Fishery Conservation and Management Act (MSA) essential fish habitat (EFH) consultation for maintenance dredging in Multnomah Creek, Multnomah County, Oregon. The Oregon Department of Transportation (ODOT) would conduct the work in cooperation with the CRGNSA. The CRGNSA and ODOT are responsible for the project design and construction management.

In the February 21, 2003, letter and BA, the CRGNSA determined that the following three listed evolutionarily significant units (ESUs) of Columbia basin salmonids may occur within the project area: Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*), LCR chinook salmon (*O. tshawytscha*), and Columbia River (CR) chum salmon (*O. keta*). Subsequently, the USFS determined that the proposed action is "likely to adversely affect" (LAA) LCR chinook salmon, LCR steelhead, and CR chum salmon. LCR steelhead were listed as threatened on March 19, 1998 (63 FR 13347), LCR chinook salmon as threatened on March 24, 1999 (64 FR 14308), and CR chum salmon as threatened on March 25, 1999 (64 FR 14508). The CRGNSA determined the proposed action will not adversely effect EFH for chinook or coho salmon.

The objective of this consultation is to determine whether the proposed action is likely to jeopardize the continued existence of the three listed ESUs of Columbia basin salmonids described above and to explain why NOAA Fisheries believes the proposed action will adversely affect the EFH for chinook and coho salmon.

This biological opinion (Opinion) is based on the information presented in the BA, site visits, and discussions with CRGNSA, ODOT, and the Oregon Department of Fish and Wildlife (ODFW).

1.2 Proposed Action

The proposed action involves maintenance dredging in Multnomah Creek. The project BA includes a set of conservation measures or best management practices (BMPs) designed to minimize adverse effects to steelhead, chinook salmon, and chum salmon and their habitats. These BMPs are described on pages 13-16 of the BA. Specific BMPs for work area isolation, fish removal and rescue, bedload removal, channel reshaping, erosion control, hazardous materials, and site-specific conservation measures are included. NOAA Fisheries regards these BMPs as integral components of the project and considers them to be part of the proposed action.

Routine dredging is required in Multnomah Creek to remove accumulated bedload material from the stream for the purpose of protecting CRGNSA and ODOT facilities and public safety. In the past 10 years, ODOT has had to remove rock and gravel from Multnomah Creek every two years, on average, to respond to emergency flooding and to protect the facilities from additional damage. The reach of Multnomah Creek that requires routine dredging is within, and adjacent to, property owned and maintained by CRGNSA, ODOT, Union Pacific Railroad, Multnomah Falls Lodge, and Oregon State Parks. However, the work is conducted by ODOT District 2C Maintenance office, under an Intergovernmental Agreement (IGA) with CRGNSA.

The purpose of the proposed bedload maintenance is for the purpose of protecting CRGNSA and ODOT facilities and to protect public safety from flooding, particularly during harsh storm events. An ice storm in the winter of 1996/1997 blocked the channel beneath the Historic Highway 30 bridge and the railroad bridge, diverting the stream into the plaza in front of the Multnomah Falls Lodge. There was damage to the lodge and park facilities and public safety was threatened. Multnomah Falls is one of the most popular recreational areas in the state of Oregon, with an average use of two million visitors per year. The main parking area is between the traveling lanes of I-84, and access to the park is along a pedestrian walkway through a tunnel under the east bound lane of I-84. Frequent flooding of the pedestrian walkway is a public safety issue because it causes pedestrians to cross over the railroad tracks, even when closure notices are posted. Routine removal of accumulated bedload material in the stream is necessary to minimize the risk of flooding during major events.

The extent of maintenance dredging in Multnomah Creek is event-driven, and varies depending on the quantity and timing of material that accumulates in the creek. ODOT will conduct the dredging during the ODFW recommended in-water work period, from July 15 through August 31. However, if water levels are expected to be lower at a later part of the year, the CRGNSA may request an extension of the in-water work period. The goal is to conduct the work during the lowest water levels, after fry have emerged from spawning gravels, and outside of the period when migration and spawning occurs. ODOT will coordinate with ODFW and CRGNSA fisheries biologists each year that dredging is required to schedule the work during the optimal period to minimize direct harm to fish. Dredging may not be conducted each year, but is anticipated to be needed at least every three years. The CRGNSA, in cooperation with ODOT, anticipates that dredging would be required twice within the next five years. Two main dredging plans have been developed for the varying site conditions: Isolated Excavation and Channel Dredging as described in sections 1.2.1 and 1.2.2, below.

Direct effects to listed species may occur at the project sites based on: (1) The potential for impairing fish passage; (2) change to stream hydraulics; (3) sediment and pollutant discharge; (4) risk of chemical contamination of the aquatic environment; and (5) the extent of riparian habitat modifications. Indirect effects to listed species may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. As such, the action area for the proposed activities includes the immediate watershed where the proposed action will occur, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes

of this Opinion, the action area is defined as the streambed and streambank of Multnomah Creek, extending upstream to the project disturbance limits, and downstream below the project disturbance limits to, and within, Benson Lake.

1.2.1 Maintenance Dredging Plan A - Isolated Excavation

Isolated excavation would be conducted when a limited amount of bedload needs to be removed and complete work area isolation is not needed. Under this dredging plan, bedload will only be removed from two exposed point bars, one located along the east shoreline just downstream of the Historic Highway 30 bridge over Multnomah Creek and the second, located along the west shoreline just downstream of the pedestrian bridge over Multnomah Creek.

The trigger elevation for Dredging Plan A, would be the accumulation of at least one foot of bedload above the target elevation (depicted by the blue line in Figure 1) or is expected, in the best professional judgement of the ODOT maintenance supervisor, to exceed the target elevation prior to the next in-water work period. The amount of excavated bedload will vary depending the amount accumulated above the target dredging elevation of 0.2 feet above the creek thalweg and the configuration of the point bars relative to the flowing channel (depicted as shaded areas at, and just downstream) in area 2 in Figure 2 . The approximate dredged contours are shown by the green line in Figure 1. A spider hoe would be used to excavate bedload from the dredged area(s) and to minimize the potential for adverse effects while crossing the wetted channel. No excavation would occur within the wetted channel except to breach the gravel berms between the excavated point bars and the wetted channel, if necessary, to avoid the potential of fish entrapment. Work area isolation, dewatering, and fish removal would not be necessary under Dredging Plan A. The placement and removal of sediment control devices and the crossing of the wetted channel with the spider hoe would be the only work within the wetted channel.

1.2.2 Maintenance Dredging Plan B - Channel Dredging

Under this dredging plan, channel dredging would be conducted when the amount of bedload needed to be removed or the volume of stream flow is so great, that isolated excavation is insufficient or infeasible and thus, total or partial work area isolation is required. The maximum extent of dredging will depend on the amount and extent of excess bedload accumulation not to exceed that area between the upper and lower coffer dams as depicted in Figure 3.

The trigger elevation for Dredging Plan B, would be the accumulation of at least one foot of bedload above the target elevation, or is expected, in the best professional judgement of the ODOT maintenance supervisor, to exceed the target elevation prior to the next in-water work period depicted by the blue line in Figure 4, 5, or 6. The amount of excavated bedload would vary depending the amount accumulated above the target dredging contours and elevations as depicted in Figures 1, 4, 5 and 6 and the plan view as depicted in Figure 3. The final dredged contours would approximate the predicted natural fluvial contours at each cross-section as depicted by the pink lines in Figures 1, 4, 5 and 6.

Figure 1. Dredging Contours Isolated Dredging Option, Cross-Section 2

Note: View is facing downstream.

Figure 2. Plan View Isolated Dredging Option

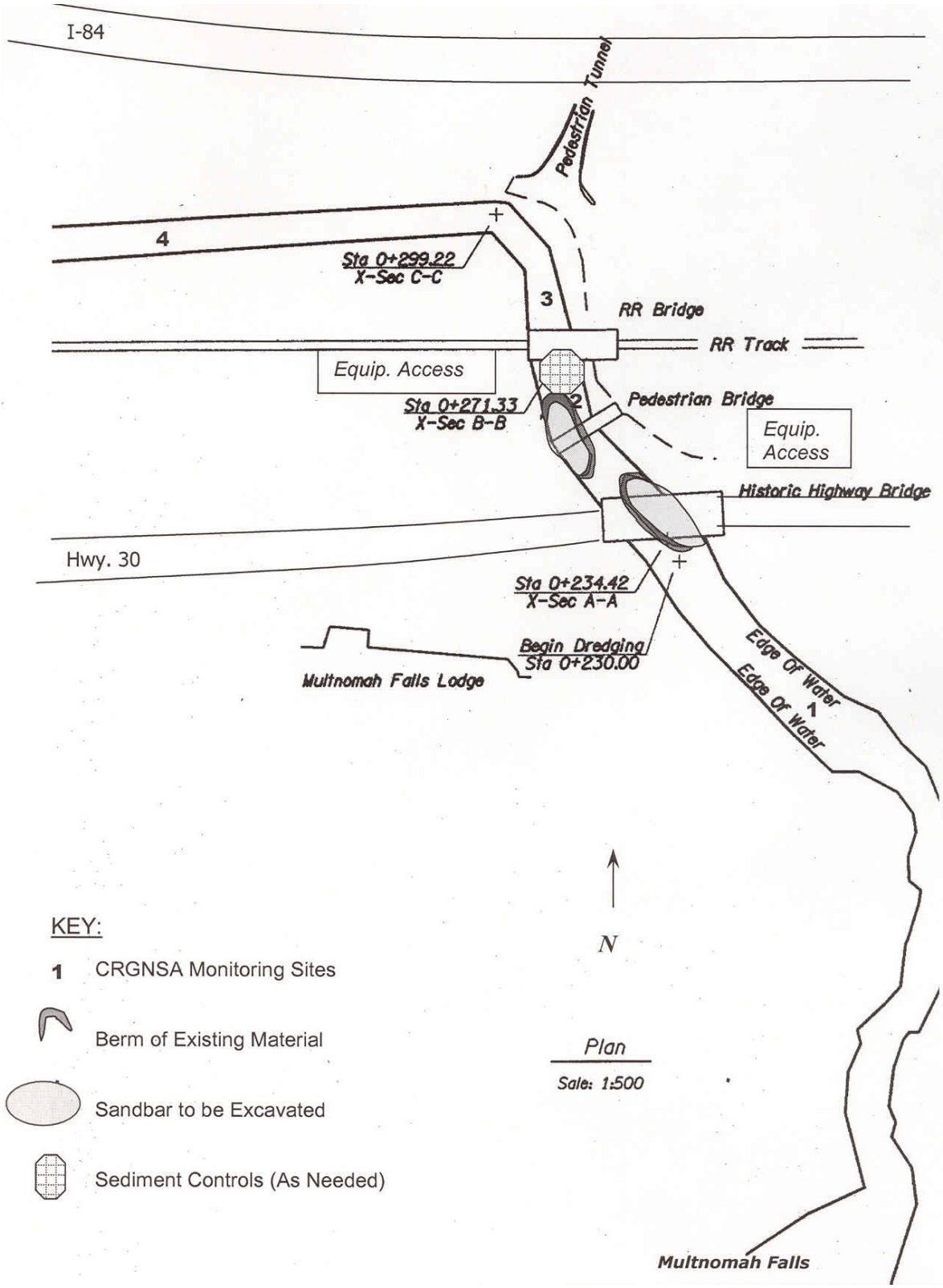


Figure 3. Plan View Channel Dredging Option

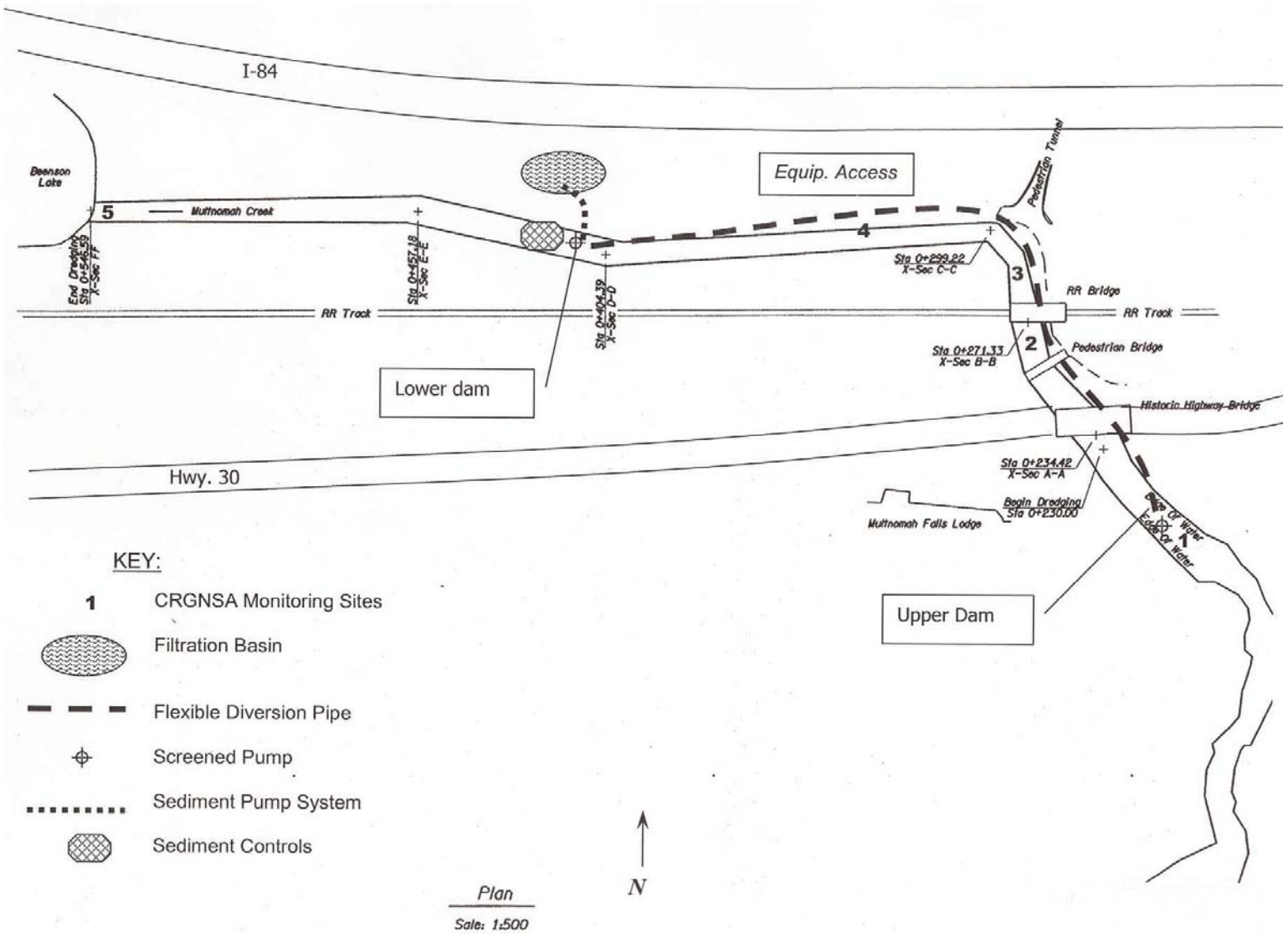
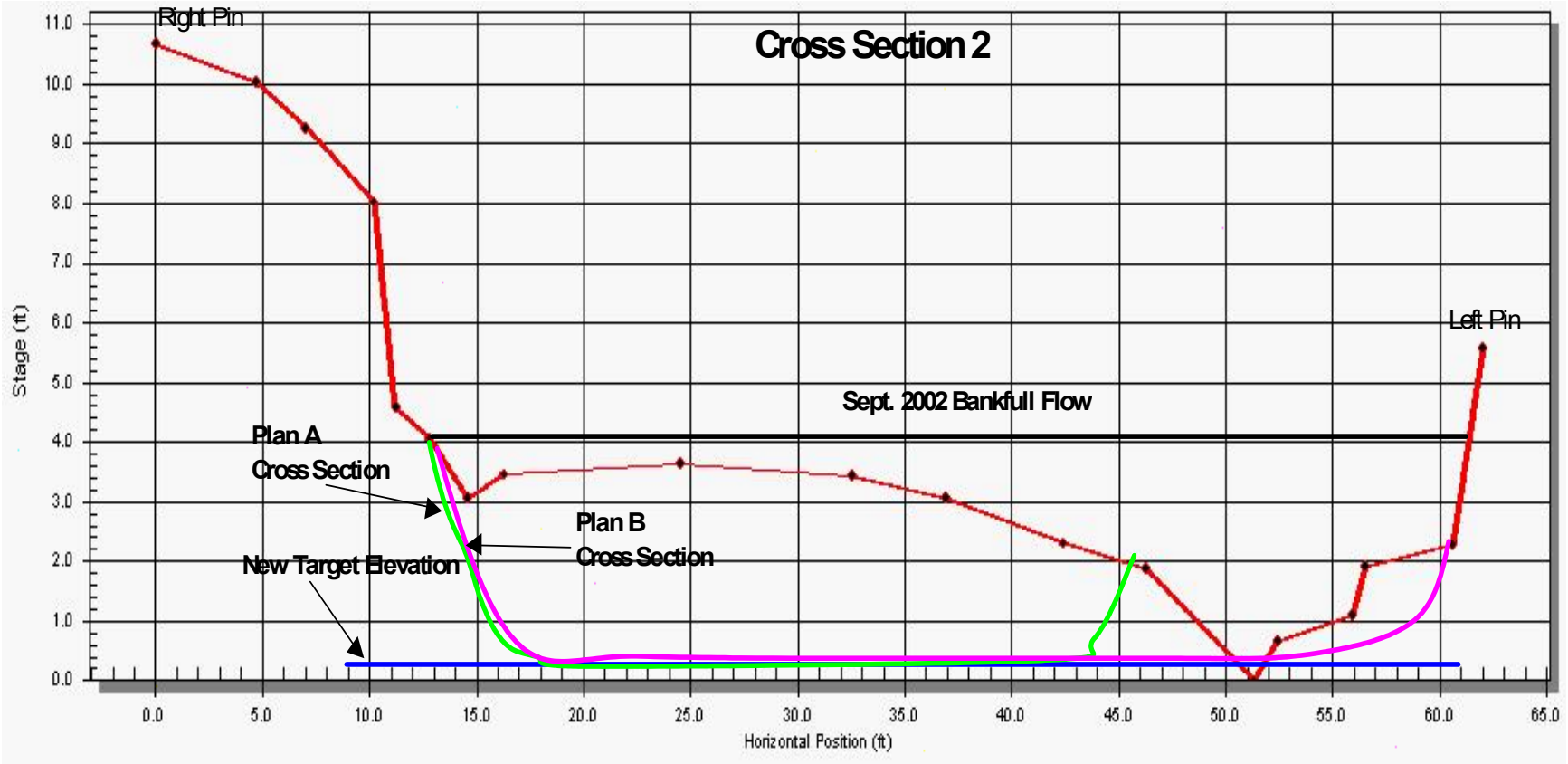
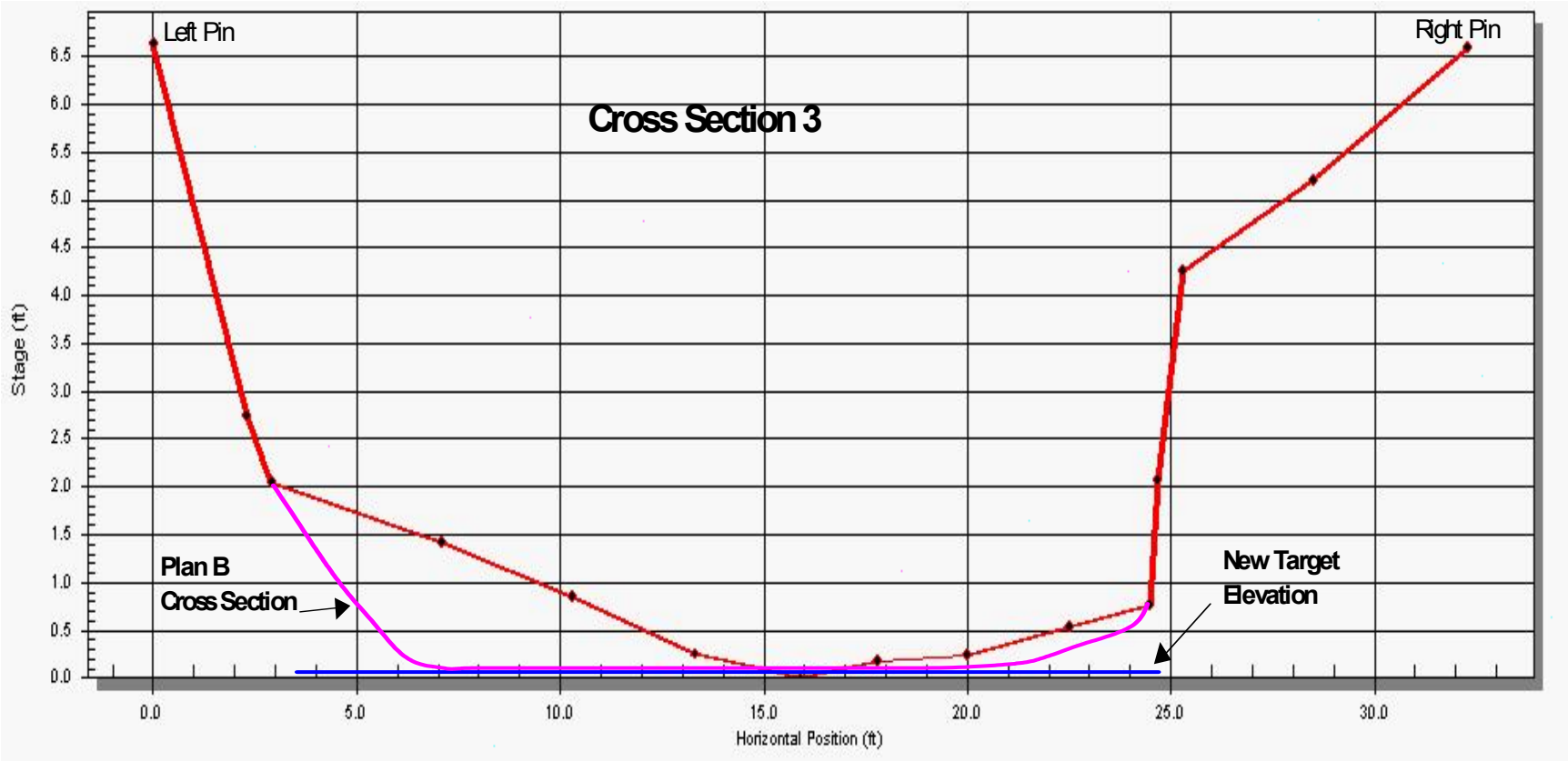


Figure 4. Dredging Contours Channel Dredging Option, Cross-Section 2



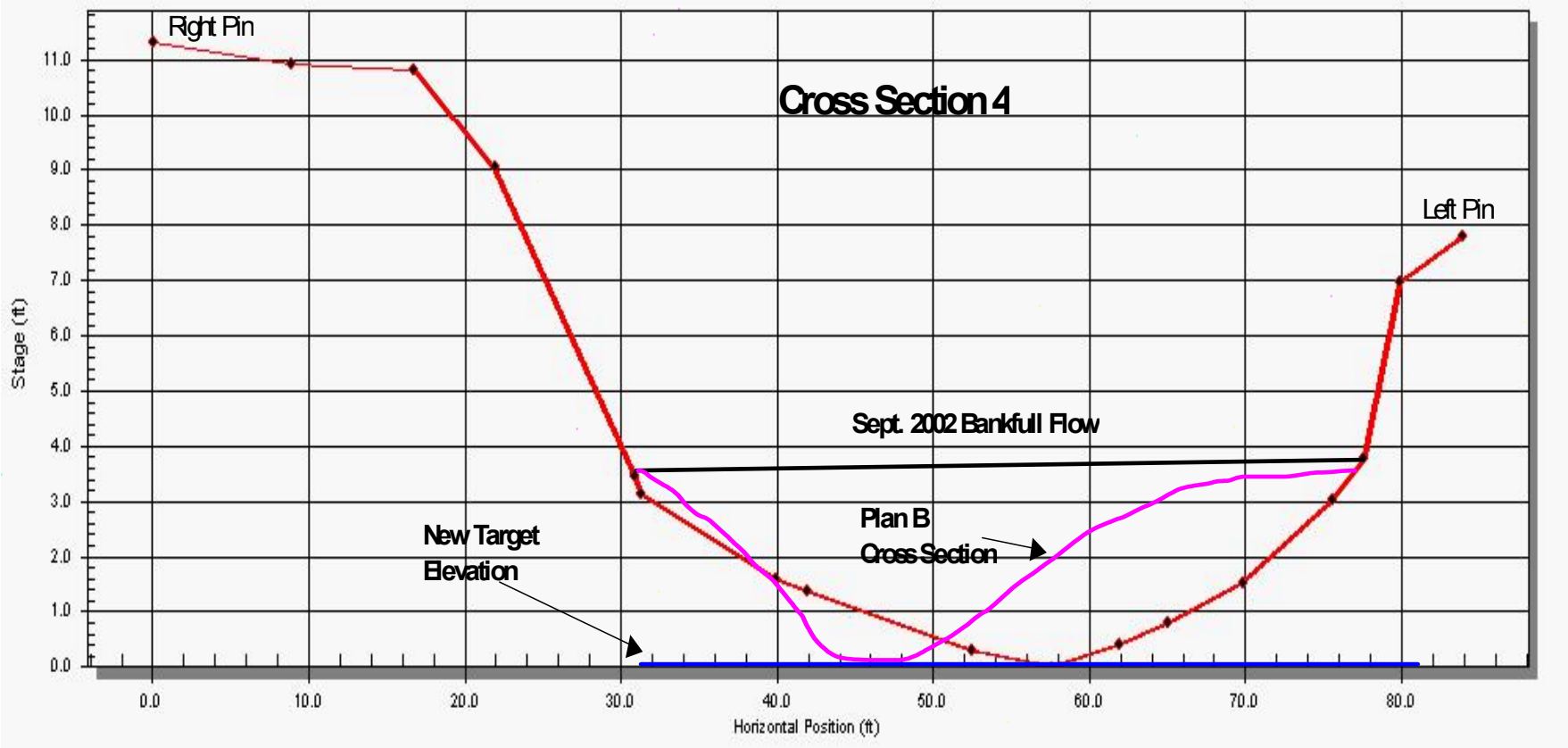
Note: View is facing downstream.

Figure 5. Dredging Contours Channel Dredging Option, Cross-Section 3



Note: View is facing downstream.

Figure 6. Dredging Contours Channel Dredging Option, Cross-Section 4



Note: View is facing downstream.

The channel dredging option would require installation of a temporary bypass system, complete or partial work area isolation, and fish removal as feasible depending on creek flows. The temporary bypass system would include the installation of a series of coffer dams to collect creek flow above and bypass the isolated work area. The temporary bypass system may convey flows through a gravity fed and/or actively pumped system depending on flow volume and site conditions during dredging. Fish and other aquatic species would be removed from the isolated work area by qualified ODOT, ODFW, or CRGNSA biologists. Erosion and sediment control devices and/or strategies such as pumping sediment laden water from within the isolated work area through settling basins would be implemented to limit downstream turbidity.

The channel dredging option Plan B would require the use of heavy equipment within the wetted channel. Work within the channel would likely consist of a bulldozer, excavator, backhoe, and dump truck working in combination to remove excess bedload from within the dredging area. The bulldozer would push bedload to the excavator or backhoe, and dredged bedload would be transferred directly into the dump truck or through bucket-to-bucket transfer if additional excavators or backhoes are needed.

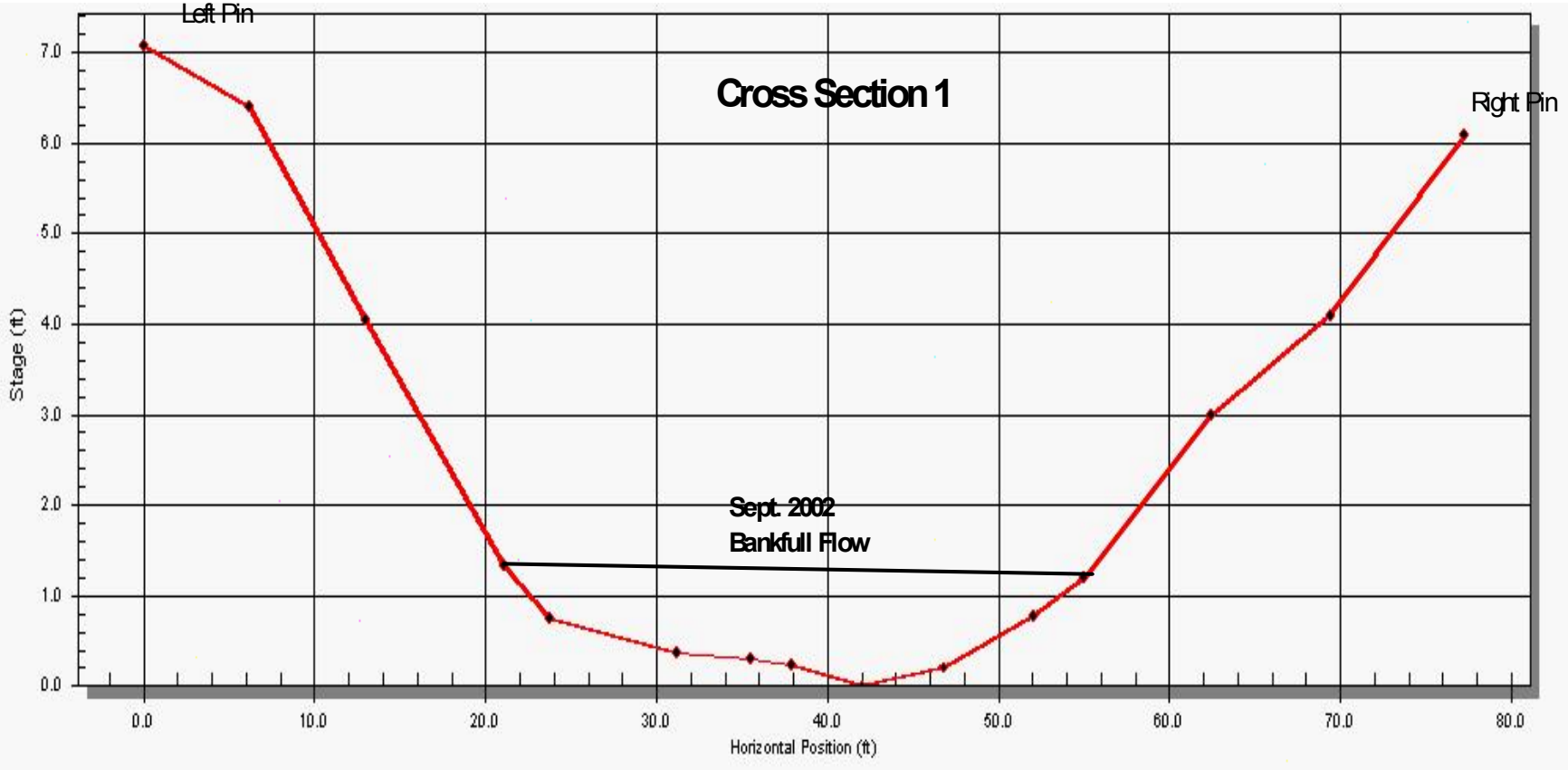
On completion of excavation of necessary bedload, the creek bottom would be recontoured to approximate the final dredged contours at each cross-section as depicted by the pink lines in Figures 1, 4, 5 and 6. The temporary bypass system would be dismantled and the work area carefully rewatered in such a manner as to maintain the flowing water downstream of the work area at all times.

1.2.3 Habitat and Bedload Monitoring

The proposed action includes a modified version of the long term habitat and bedload accumulation monitoring activities that the CRGNSA has been conducting at cross-sections 2, 3, and 4, since 1997 and cross-sections 1 and 5 (Figures 7 & 8), since 2002. These designated cross-sections are within the action area and marked in Figure 3. The purpose of the 1997 monitoring plan was to monitor changes in the bedload elevation that would trigger the need for bedload dredging activities. Monitoring at cross-sections 1 and 5 were added in 2002, at the request of NOAA Fisheries, during pre-consultation meetings to cooperatively develop the proposed action.

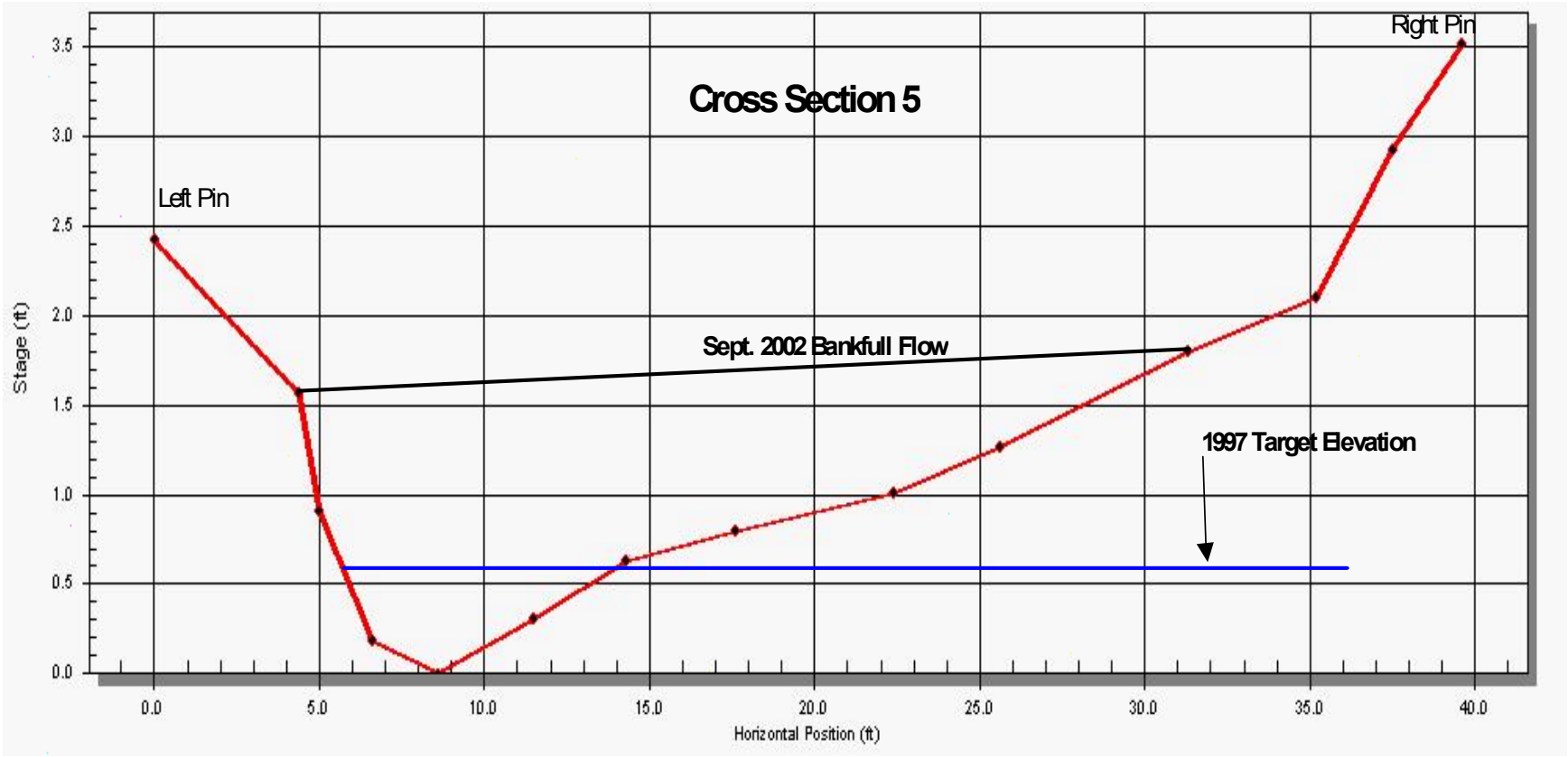
The modified habitat and bedload monitoring plan would include monitoring changes of bedload accumulation, detailed stream channel geometry, substrate composition, and riparian vegetation at the five designated cross-sections, through time, as a result of dredging activities. The five cross-sections will be monitored, as described above, at least once each year during summer low flow, prior to major fall runoff events. Cross-section monitoring will occur just prior to, and following, any bedload removal activities in years when dredging is necessary. The CRGNSA proposes to submit an annual monitoring report to NOAA Fisheries with information on channel cross-section monitoring, longitudinal channel profile, standard Wolman pebble counts at each cross-section, and photo documentation of riparian vegetation.

Figure 7. Dredging Contours Channel Dredging Option, Cross-Section 1



Note: View is facing downstream.

Figure 8. Dredging Contours Channel Dredging Option, Cross-Section 5



Note: View is facing downstream.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

Essential features of salmonid habitat required for the survival and recovery of listed species are water quality, water quantity, water temperature, water velocity, substrate, cover/shelter, food, space, and safe passage conditions (NMFS 1996). Together, these factors determine the biotic composition, structure, function, and stability of aquatic and riparian ecosystems and their ability to support the biological requirements of the species (Spence *et al.* 1996).

Pacific anadromous salmonid populations in the Pacific Northwest have evolved under the unimpaired flow regimes historically provided by their natal streams. The flow regimes reflect the dynamic character of fluvial systems which is determined by the quantity, timing and natural variability of stream flow. These characteristics drive many of the physical processes in watersheds that are important to salmonid survival and conservation. Unimpaired flow regimes benefit salmonids in two critical ways: (1) They provide temporally- and spatially-appropriate water quantities to support specific life stages, and (2) they ensure self-sustaining ecosystem processes by which salmonid habitat is created and maintained over time.

Dynamic hydraulic, geomorphic, and ecologic processes must be maintained to provide salmonids with a high probability of access to sufficient quantities of quality habitats for timely and successful completion of each and every life stage in freshwater (Bisson *et al.* 1997). However, given inter-annual hydrologic variability, even under an unimpaired flow regime, the quantity and quality of freshwater habitat necessary to obtain food and grow, escape predation, resist disease, migrate, and survive extreme environmental events is highly variable and can readily become limiting (Bjornn and Reiser 1991). Stream-rearing salmonids must survive for extended periods in freshwater through winter- and summer-rearing bottlenecks (Bjornn and Reiser 1991). In addition, environmental conditions during extensive downstream and upstream migrations during juvenile and smolt life stages and again during adult and pre-spawning life stages can also significantly limit survival.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of defining the biological requirements and current status of the listed species, and evaluating the relevance of the environmental baseline to the species' current status. Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and

(3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action. For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action.

2.1.3 Biological Requirements

The first step in the method NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the biological requirements of the species most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species by taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list LCR steelhead, LCR chinook salmon, and CR chum salmon for ESA protection, and also considers new data available that are relevant to the determination.

The relevant biological requirements are those necessary for LCR steelhead, LCR chinook salmon, and CR chum salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are habitat characteristics that function to support successful spawning, rearing, and migration. These involve adequate fish passage, water quality, water quantity, substrate, shade, and cover. Because the current status of the LCR steelhead, LCR chinook salmon, and CR chum salmon, based upon their risk of extinction, has not significantly improved since the species were listed, adverse impacts to these biological requirements have the potential to be significant.

2.1.4 Environmental Baseline

The environmental baseline is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined as all areas (bankline, adjacent riparian zone, and aquatic area) to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02).

Columbia River

The most recent evaluation of the environmental baseline for the Columbia River is part of the NOAA Fisheries Biological Opinion for the Federal Columbia River Power System (FCRPS) issued in December 2000. This biological opinion assessed the entire Columbia River system below Chief Joseph Dam, and downstream to the farthest point (the Columbia River estuary and nearshore ocean environment) at which listed salmonids are influenced. For a detailed

evaluation of the environmental baseline of the Columbia River basin, please refer to the FCRPS biological opinion (NMFS 2000).

The quality and quantity of freshwater habitats in much of the Columbia River basin have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and urbanization have radically changed the historical habitat conditions of the basin.

Water quality in streams throughout the Columbia River basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and grazing, road construction, timber harvest activities, mining activities, and urbanization. Sediment and contaminants from the tributaries settle in mainstem reaches and the estuary, and contribute to poor water quality. Temperature alterations affect salmonid metabolism, growth rate, spawning success, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land usage that creates shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low concentrations of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a significant cause of habitat degradation and reduced fish production. Withdrawing water for irrigation, urban, and other uses can increase temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers. On a larger landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been developed. Urbanization paves over or compacts soil and alters the volume and timing of runoff reaching rivers and streams.

The environmental baseline along the reach of the Columbia River adjacent to the mouth of Wahkeena and Multnomah Creeks has been degraded by human activity. This area consists of constructed highway embankments in various states of failure along the Oregon shore. The riparian area in this reach of the Columbia River contains little cover and vegetation. The development of this area contributes to the degraded conditions of the Columbia River, including reduced water quality, increased water temperature, altered timing and quantity of runoff, and decreased riparian cover and habitat refugia.

Confluence of Multnomah and Wahkeena Creeks at Interstate 84

Multnomah Creek historically entered the Columbia River, via an independent stream channel running directly north from Multnomah Falls through what is now the Multnomah Falls parking area/rest area access point from Interstate 84. Today, Multnomah Creek flows west at Interstate 84 and parallels the highway through an artificial channel. The altered Multnomah Creek channel flows into, and through, Benson Lake shortly before joining with, and sharing, Wahkeena Creek's stream channel. The two creeks join and flow directly north through a triple box culvert under Interstate 84 to the Columbia River.

This triple box culvert restricts upstream migration of all juvenile salmonids and most adult salmonids at both low and high flows. Adult coho salmon and steelhead have been observed nearly every year upstream of the Interstate 84 culvert. Chinook and chum salmon are less often able to pass upstream due to their migration timing relative to annual stream discharge and, in the case of chum salmon, their apparent reluctance to jump. However, the Federal Highway Administration (FHWA) has proposed, in cooperation with ODOT, to retrofit the culvert during the summer of 2003 to improve fish passage conditions. As a result, NOAA Fisheries anticipates the action area will be readily accessible to and used by chinook and chum salmon for spawning and rearing concurrent with the duration of this consultation.

Multnomah Creek

The Multnomah Creek drainage is approximately 4.3 km to its confluence with Wahkeena Creek just above the Interstate 84 culvert. The channel geometry has been greatly altered below Multnomah Falls by the adjacent railroad fill and bridge, the historic Highway 30 bridge, the Multnomah Falls Lodge and parking area, Benson State Park, and by the construction of Interstate 84 that essentially rechanneled Multnomah Creek through Benson Lake to its artificial confluence with Wahkeena Creek as described above.

Despite the rechannelization of Multnomah Creek and because most of the drainage of Multnomah Creek is within the CRGNSA, the riparian habitat is mostly intact and functional, facilitating adequate water quality, water quantity, and complex habitat features capable of supporting reproducing anadromous fish populations.

Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect affects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. For this consultation, the action area is within the Multnomah Creek watershed as described in section 1.2 of this consultation.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

Creeks and rivers are dynamic systems that naturally alter their courses in response to many physical processes. Roadways and other structures constructed along waterways are subject to flooding, undercutting, and bedload deposition as a result of these natural changes in the stream course. Structural hardening of embankments is the traditional means of protecting these structures along waterways. The structural hardening limit natural fluvial processes resulting in impacts to the waterway.

Fish habitats are enhanced by the diversity of habitats at the land-water interface and adjacent bank (USACE 1977). Dynamic interaction of discharge and bedload transport create and maintain diverse salmonid habitats within the action area, and streamside vegetation provides shade that reduces water temperature. Overhanging branches provide cover from predators. Insects and other invertebrates that fall from overhanging branches may be preyed upon by fish, or provide food sources for other prey organisms. Immersed vegetation, logs, and root wads provide points of attachment for aquatic prey organisms, shelter from swift currents during high flow events, retain bedload materials, and reduce flow velocity.

Sedimentation

Potential impacts to listed salmonids from the proposed action include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from bedload dredging activities. Potential indirect effects include behavioral changes resulting from elevated turbidity level (Sigler *et al.* 1984, Berg and Northcote 1985, Whitman *et al.* 1982, Gregory 1988), during river bank habitat alterations.

Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1988).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from piscivorus fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991).

Excavation in the stream channel associated with the bedload dredging activities and other in-water work in Multnomah Creek may elevate the risk for turbidity and sediment transport within the action area. Because the potential for turbidity should be localized and brief, the probability of direct mortality is negligible. In-water work timing during the preferred in-water work timing period of July 15 through August 31, work area isolation, and fish removal would be employed as necessary, depending on presence of fish and/or flowing water to minimize the risk from turbidity and sediment transport during in-water work activities.

Chemical Contamination

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of the backhoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a water body or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). Similarly, exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non target riparian vegetation (Spence *et al.* 1996).

Excavation in the stream channel associated with the bedload dredging activities will elevate the risk for chemical contamination of the aquatic environment within the action area. Because the potential for chemical contamination should be localized and brief, the probability of direct mortality is negligible. In-water work timing during the preferred in-water work timing period of July 15 through August 31, work area isolation, and fish removal would be employed as necessary, depending on presence of fish and/or flowing water to minimize the risk from chemical contamination during in-water work activities. The contractor or maintenance supervisor would also be required to develop, implement and monitor a site specific pollution control plan in an effort to further minimize risk to the aquatic environment.

Loss of Primary Productivity

The proposed action, under channel dredging Plan B, would likely result in a short-term reduction in primary productivity in the newly dredged channel areas. As creek flow is reintroduced into these dredged locations, redistribution of aquatic vegetation and benthic invertebrates would result in a temporary reduction in the availability of food for rearing juvenile salmonids.

Bedload Transport

The objective of the proposed action is to remove part or all of the total annual bedload migration within the dredged areas of Multnomah Creek. Because no monitoring data exists to determine what portion of the total annual bedload is removed, ecosystem connectivity in the form of adequate bedload transport to downstream channel reaches may be compromised as a result of the dredging activities. This may result in adverse effects to formation and maintenance of habitat features such as salmonid spawning gravels. As part of the proposed actions, the CRGNSA has proposed to monitor bedload composition and transport on an annual basis to determine the magnitude of any effects to salmonid habitat within and downstream of the dredging activities.

Fish Rescue, Salvage, and Relocation

As a result of the proposed action, specifically the channel dredging option, Dredging Plan B, potential direct handling of listed salmonids during work area isolation and fish removal may occur. Direct and delayed mortality of LCR steelhead, LCR chinook salmon, or CR chum salmon juvenile from capture and relocation stress may occur during fish removal and salvage efforts.

Fish Passage

Although fish passage may be temporarily impaired for no more than five days during any given period while passing Multnomah Creek water around the isolated work area, during Dredging Plan B, the proposed action would not result in long term effects to fish passage within the action area.

2.1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation". Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these action are not considered cumulative to the proposed action.

NOAA Fisheries is not aware of any specific future non-Federal activities within the action area that would cause greater impacts to listed species than presently occurs. NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years.

2.1.6 Conclusion

NOAA Fisheries has determined that, based on the available information, the proposed action is not likely to jeopardize the continued existence of LCR steelhead, LCR chinook salmon, or CR chum salmon. NOAA Fisheries used the best available scientific and commercial data to analyze the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NOAA Fisheries applied its evaluation methodology to the proposed action and found that it could cause short-term degradation of anadromous salmonid habitat due to increases in sedimentation, turbidity, temporary blockage of fish passage, and risk of chemical contamination of the aquatic environment. Furthermore, NOAA Fisheries expects that bedload dredging-related effects, work area isolation, and fish removal activities could alter normal feeding and sheltering behavior of juvenile LCR steelhead, LCR chinook salmon, or CR chum salmon should any be present in the action area during the proposed action. NOAA Fisheries expects some direct or delayed mortality of juvenile LCR steelhead, LCR chinook salmon, or CR chum salmon as a result of fish rescue, salvage and relocation activities should any be present in the action area during the proposed action.

NOAA Fisheries' conclusions are based on the following considerations: (1) Most of the proposed work under Dredging Plan A will occur outside of the flowing waters of the Multnomah Creek (*i.e.*, in the dry); (2) in-water work will occur during the ODFW preferred in-water work period of July 15 through August 31, which NOAA Fisheries expects to minimize the likelihood of LCR steelhead, LCR chinook salmon, CR chum salmon being present in the action area due to low flow conditions; (3) any increases in sedimentation and turbidity in the project reach of Multnomah Creek will be short-term and minor in scale, and would not change or worsen existing conditions for stream substrate in the action area; (4) an extensive complete or partial work area isolation plan would be implemented under Dredging Plan B to minimize potential short-term, adverse effects and to avoid long-term, adverse effects as a result of the proposed action; and (5) neither Plan A or Plan B is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress

of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitats, or to develop additional information. NOAA Fisheries believes the following conservation recommendations are consistent with these obligations, and therefore should be carried out by the CRGNSA. This information will help to reduce uncertainty about the effects of past and ongoing human and natural factors leading to the status of listed salmon and steelhead, their habitats, and the aquatic ecosystem within the action area.

1. To the greatest extent possible, the CRGNSA, in cooperation with ODOT, should develop a long-term plan to modify the current infrastructure altering the natural bedload transport and depositional characteristics of Multnomah Creek. NOAA Fisheries believes the current influence of the surrounding infrastructure exacerbates the accelerated deposition of bedload within the action area.

2. In addition to development of a long-term plan to modify the current infrastructure, the CRGNSA, in cooperation with ODOT, should also continue to investigate and develop alternate methods to achieve the objective of maintenance dredging, while further minimizing potential adverse effects to listed salmonids and their habitats.

2.1.8 Reintiation of Consultation

This concludes formal consultation on the Maintenance Dredging in Multnomah Creek Project. As provided in 50 CFR 402.16, reintiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or
(4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of authorized incidental take is exceeded, any operations causing such take must cease pending reintiation of consultation.

If the CRGNSA fails to provide the specified annual monitoring information, NOAA Fisheries would consider that a modification of the action that causes an effect on listed species not previously considered and would cause this Opinion to expire. Consultation also must be

reinitiated five years after the date this Opinion is signed. To reinitiate consultation, contact the Habitat Conservation Division (Oregon Habitat Branch) of NOAA Fisheries.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species to by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. "Incidental take" is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of listed species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of LCR steelhead, LCR chinook salmon, or CR chum salmon because of potential adverse effects from increased sedimentation, turbidity, risk of chemical contamination, and the potential for direct incidental take during in-water work. Handling of juvenile steelhead, chinook salmon, or chum salmon during the work isolation process may result in incidental take of individuals if adequate water quantity and quality allows juvenile salmonids to be present during the bedload dredging period. Based on estimates provided in the BA, NOAA Fisheries anticipates non-lethal incidental take of up to1440 individuals, of which, lethal take of 72 juvenile steelhead, chinook salmon, or chum salmon could occur as a result of the fish rescue, salvage and relocation activities, during the five-year period covered by this Opinion. The potential adverse effects of the other project components on population levels are largely unquantifiable and NOAA Fisheries does not expect them to be measurable in the long term. The extent of authorized take is limited to LCR steelhead, LCR chinook salmon, or CR chum salmon in Multnomah Creek and is limited to that caused by the proposed action within the action area.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The CRGNSA has the continuing duty to regulate the activities covered in this incidental take statement. If the CRGNSA fails to require the contractor or maintenance supervisor to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(a)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the above species. The CRGNSA shall:

1. Minimize the likelihood of incidental take from bedload dredging actions by directing the contractor or maintenance personnel to use an approach that maximizes ecological functions and avoids or minimizes disturbance to the riparian and aquatic systems.
2. Minimize the likelihood of incidental take from in-water work activities by ensuring that the in-water work activities (*e.g.* bedload channel dredging, Dredging Plan B) are fully or partially isolated from flowing water.

3. Complete a comprehensive monitoring and reporting program to ensure implementation of these conservation measures are effective in minimizing the likelihood of take from permitted activities.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, CRGNSA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To implement reasonable and prudent measure #1 (bedload dredging activities), the CRGNSA shall ensure that:

    a. Large Wood and Riparian Vegetation. Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site or be replaced with a functional equivalent..
    b. Project design. Alteration or disturbance of the streambanks and existing riparian vegetation will be minimized.
    c. In-water work. All work within the active channel will be completed within the in-water work period of July 15 - August 31. Extensions of the in-water work period must be concurred with in writing by NOAA Fisheries.
    d. Pollution and erosion control plan. A pollution and erosion control plan (PECP) will be developed for the project to prevent point-source pollution related to

construction operations. The PECP will contain the pertinent elements listed below, and will meet requirements of all applicable laws and regulations:

i. Measures will be taken to prevent erosion and sedimentation associated with access roads, construction sites, equipment and material storage sites, fueling operations and staging areas.

ii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.

iii. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.

iv. A floating containment boom will be installed downstream of the dredging area prior to any dredging activity within the wetted channel.

v. Measures will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during dredging operations will be removed in a manner that has a minimum impact on the streambed and water quality.

e. Pre-construction activities. Prior to significant alteration of the action area, the following actions will be accomplished:

i. Boundaries of the clearing limits associated with site access and staging are flagged to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. A supply of erosion control materials (*e.g.*, silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.

iii. All temporary erosion controls (*e.g.*, straw bales, silt fences) are in place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

f. Earthwork. Earthwork, including bedload dredging, is completed in the following manner:

i. Material removed during excavation will only be placed in locations where it cannot enter streams or other water bodies.

ii. All exposed or disturbed areas will be stabilized to prevent erosion.

(1) Areas of bare soil within 150 feet of waterways, wetlands or other sensitive areas will be stabilized by native seeding,[1] mulching, and placement of erosion control blankets and mats, if applicable,

[1] By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

quickly as reasonable after exposure, but within seven days of exposure.

(2) All other areas will be stabilized as quickly as reasonable, but within 14 days of exposure.

(3) Seeding outside of the growing season will not be considered adequate for permanent stabilization.

g. Heavy Equipment. Heavy equipment use will be fueled, maintained and stored as follows:

i. Vehicle staging, maintenance, refueling, and fuel storage areas will be a minimum of 150 feet horizontal distance from any stream.

ii. All vehicles operated within 150 feet of any stream or water body will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.

iii. When not in use, vehicles will be stored in the vehicle staging areas.

h. Site restoration. Site restoration and cleanup, including protection of bare earth by seeding, planting, mulching and fertilizing, will be done in the following manner:

i. Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project is located, and will comprise a diverse assemblage of woody and herbaceous species.

ii. No herbicide application will occur as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.

iii. No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.

2. To implement reasonable and prudent measure #2 (in-water work area activities), the CRGNSA shall ensure that the in-water work activities (*e.g.* bedload channel dredging, Dredging Plan B) are isolated fully or, if site condition preclude full isolation, partially isolated from flowing water.

a. If the fish salvaging aspect of this project requires the use of seine equipment to capture fish, it must be accomplished as follows:

i. Before and intermittently during pumping, attempts will be made to seine and release fish from the work isolation area as is prudent to minimize risk of injury.

ii. Seining will be conducted by, or under the supervision of a fishery biologist experienced in such efforts. Staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

iii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever appropriate, to prevent the added stress of an out-of-water transfer.

iv. Seined fish must be released as near as possible to capture sites.

v. The CRGNSA shall ensure that the transfer of any ESA-listed fish to third parties other than NOAA Fisheries personnel receives prior approval from NOAA Fisheries.

vi. The CRGNSA shall ensure that any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities will be obtained prior to project seining activity.

vii. The CRGNSA must allow NOAA Fisheries or its designated representative to accompany field personnel during the seining activity, and allow such representative to inspect the seining records and facilities.

viii. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fishery biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal, the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

b. If the fish salvaging aspect of this project requires the use of electrofishing equipment to capture fish, it must be accomplished as described in NOAA Fisheries' electrofishing guidelines[2].

3. To implement reasonable and prudent measure #3 (monitoring and reporting), the CRGNSA shall ensure that:

a. Within 120 days of completing the project, the CRGNSA shall ensure submittal of a monitoring report to NOAA Fisheries describing the CRGNSA's success meeting their permit conditions. This report will consist of the following information:

i. Project identification.

(1) Project name,

(2) starting and ending dates of work completed for this project, and

(3) the CRGNSA contact person.

ii. Isolation of in-water work area. All projects involving full or partial isolation of in-water work areas must include a report of any seine and release or other fish rescue and salvage activity including:

(1) The name and address of the supervisory fish biologist,

(2) methods used to isolate the work area and minimize disturbances to fish species,

(3) stream conditions prior to and following placement and removal of barriers,

(4) the means of fish removal,

[2] NMFS/NOAA Fisheries (NOAA's National Marine Fisheries Service), *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

(5) the number of fish removed by species,
(6) the location and condition of all fish released, and
(7) any incidence of observed injury or mortality.

iii. Pollution and erosion control. A summary of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.

iv. Site conditions. Documentation of the finished streambed contours and elevations

v. A narrative assessment of the effects of the project natural stream function.

vi. Photographic documentation of environmental conditions at the project site before, during and after project completion.

(1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre- and post-construction.
(2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
(3) Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

b. On an annual basis, for the duration of this consultation, the CRGNSA shall ensure submittal of an annual monitoring report to NOAA Fisheries describing the results of the CRGNSA's proposed annual bedload and habitat monitoring activities as described in section 1.2.3 of this Opinion. This report will consist of the following information:

i. Project identification.

(1) Project name,
(2) starting and ending dates of work completed for this project, and
(3) the CRGNSA contact person.

ii. Site conditions. Documentation of the following conditions:

(1) The results of the survey of the longitudinal stream profile.
(2) The results of the detailed cross-sectional survey of each of the five designated stream channel cross-sections including changes in stream bed contour, elevation or channel geometry.
(3) The results of the Wolman pebble counts at each of the five designated cross-sections.
(4) The results of the photo documentation of riparian vegetation at each of the five designated cross-sections.

iii. A narrative assessment of the effects of the project on natural stream function.

Submit monitoring reports to:
NOAA Fisheries
Oregon Habitat Branch, Habitat Conservation Division
Attn: 2003/00147
525 NE Oregon Street, Suite 500
Portland, OR 97232-2778

c. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to NOAA Fisheries' Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington, 98661; phone: 360.418.4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENS ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem, and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH.

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activity that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For the purposes of this consultation, the action area is defined as the streambed and streambank of Multnomah Creek, extending upstream to the project disturbance limits, and downstream below the project disturbance limits to, and within, Benson Lake. This area has been designated as EFH for various life stages of chinook salmon and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 2.1.5 of this document, the proposed activities may result in short-term adverse effects to water quality (sedimentation, turbidity, and chemical contamination). NOAA Fisheries expects short term adverse effects from increases in sedimentation, turbidity, and chemical contamination within the action area.

3.5 Conclusion

The proposed action will adversely affect the EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the CRGNSA, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.2 and 2.2.3 are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The CRGNSA must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Bell, M.C. 1991. Fisheries handbook of Engineering requirements and biological criteria. FishPassage Development and Evaluation Program. U.S. Army Corps of Engineers. North Pacific Division.

Berg, L. and T.G. Northcote. 1985. Changes In Territorial, Gill-Flaring, and Feeding Behavior in Juvenile Coho Salmon (Oncorhynchus kisutch) Following Short-Term Pulses of Suspended Sediment. Canadian Journal of Fisheries and Aquatic Sciences 42: 1410-1417.

Birtwell, I. K., G. F. Hartman, B. Anderson, D. J. McLeay, and J. G. Malick. 1984. A Brief Investigation of Arctic Grayling (Thymallus arcticus) and Aquatic Invertebrates in the Minto Creek Drainage, Mayo, Yukon Territory: An Area Subjected to Placer Mining. Canadian Technical Report of Fisheries and Aquatic Sciences 1287.

Bisson, P.A., G.H. Reeves, R.E. Bilby, and R.J. Naimon. 1997. Watershed management and Pacific salmon: Desired future conditions. Pages 447-474 *in* D.J. Stouder, P.A. Bisson, and R.J. Naiman, eds. Pacific salmon and their ecosystems: Status and future options. Chapman & Hall, New York, New York, USA.

Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 *in* W.R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19:83-138.

Busby, P. J., T.C. Wainwright, G.J. Brant, L.J. Lierheimer, R.S. Waples, F.W. Waknitz, and I. V. Lagomarsino. 1996. Status Review of West Coast Steelhead from Washington, Idaho, Oregon, and California. U.S. DOC, NOAA Tech. Memo. NMFS-NWFWC-27, 115 p.

DeVore, P. W., L. T. Brooke, and W. A. Swenson. 1980. "The Effects of Red Clay Turbidity and Sedimentation on Aquatic Life In the Nemadji River System. Impact of Nonpoint Pollution Control on Western Lake Superior." S. C. Andrews, R. G. Christensen, and C. D. Wilson. Washington, D.C., U.S. Environmental Protection Agency. EPA Report 905/9-79-002-B.

Gregory, R. S., and C. D. Levings. 1998. "Turbidity Reduces Predation on Migrating Juvenile Pacific Salmon." Transactions of the American Fisheries Society 127: 275-285.

Gregory, R.S. 1993. Effect of turbidity on the predator avoidance behavior of juvenile chinook salmon (Oncorhynchus tshawytcha). Canadian J. Fish. Aquatic Sciences 50:241-246.

Gregory, R. S. 1988. Effects of Turbidity on benthic foraging and predation risk in juvenile chinook salmon. Pages 64-73 *In:* C. A. Simenstad (ed.) Effects of dredging on anadromous Pacific coast fishes. Washington Sea Grant Program. Washington State University. Seattle, Washington.

Lloyd, D. S. 1987. Turbidity as a Water Quality Standard for Salmonid Habitats in Alaska. North American Journal of Fisheries Management 7:34-45.

Neff, J.M. 1985. Polycyclic aromatic hydrocarbons. *In*: Fundamentals of aquatic toxicology, G.M. Rand and S.R. Petrocelli, pp. 416-454. Hemisphere Publishing, Washington, D.C.

Newcombe, C. P., and D. D. MacDonald. 1991. "Effects of Suspended Sediments on Aquatic Ecosystems." North American Journal of Fisheries Management 11: 72-82.

NMFS (National Marine Fisheries Service). 1996. Making Endangered Species Act determinations of effect for individual and grouped actions at the watershed scale. Habitat Conservation Program, Portland, Oregon, 32 p.

NMFS (National Marine Fisheries Service). 2000. Biological Opinion: Reinitiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin. Web site: http://www.nwr.noaa.gov/1hydrop/hydroweb/docs/Final/2000Biop.html. December 21, 2000.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.

Redding, J. M., C. B. Schreck, and F. H. Everest. 1987. "Physiological Effects on Coho Salmon and Steelhead of Exposure to Suspended Solids." Transactions of the American Fisheries Society 116: 737-744.

Scannell, P.O. 1988. Effects of Elevated Sediment Levels from Placer Mining on Survival and Behavior of Immature Arctic Grayling. Alaska Cooperative Fishery Unit, University of Alaska. Unit Contribution 27.

Servizi, J. A., and Martens, D. W. 1991. "Effects of Temperature, Season, and Fish Size on Acute Lethality of Suspended Sediments to Coho Salmon". Canadian Journal of Fisheries and Aquatic Sciences 49:1389-1395.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. “Effects of Chronic Turbidity on Density and Growth of Steelheads and Coho Salmon.” Transactions of the American Fisheries Society 113: 142-150. 1984.

Spence, B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. ManTech Environmental Research Services, Inc.,Corvallis, Oregon, to National Marine Fisheries Service, Habitat Conservation Division,Portland, Oregon (Project TR-4501-96-6057).

USACE (United States Army Corps of Engineers). 1977. Nehalem Wetlands Review: A Comprehensive Assessment of the Nehalem Bay and River (Oregon). U.S. Army Engineer District, Portland, Oregon. [Page count unknown].

Whitman, R.P., T.P. Quinn and E.L. Brannon. 1982. Influence of suspended volcanic ash on homing behavior of adult chinook salmon. Trans. Am. Fish. Soc. 113:142-150.